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THE

POLYGRAPHIC APPARATUS,

OR

THE DIFFERENT DEPARTMENTS OF ART

CARRIED ON IN THE

IMPERIAL COURT AND GOVERNMENT PRINTING-OFFICE

AT

VIENNA,

BY

LOUIS AUER,

imperial government counsellor, director of the imperial Court and Government printing-office, knight of the imp. Austrian orders of the iron crown third class and of Francis-Joseph, of the papal Gregory order, of the Brasilian order of the rose, of the order of the Zähringer lion of the grand-duke of Baden, of the Louis-order first class of the grand-duke of Hesse, proprietor of the Austrian large golden medal for art and science, actual member of the imp. academy of sciences at Vienna, of the German-Oriental society at Halle-Leipsic, of the Asiatic society at Paris, of the royal Asiatic society of Great-Britain and Ireland at London, member of the Upper-Austrian trade-society and of the Museum Francisco-Carolinum for Austria above the river Enns and Salzburg, honorary member of the historical society for Carinthia, of the British academy for science, art, and trade, and of the Ethnological-society of London, then corresponding member of the royal academy of sciences and the fine arts at Modena.

I. AND II. LECTURE.

THE DESCRIPTION AND PRACTICAL APPLICATION OF THE POLYGRAPHIC APPARATUS.

VIENNA, 1853.

FROM THE IMPERIAL COURT AND GOVERNMENT PRINTING-OFFICE.

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No other invention has been productive of such divine objects, as Gutenberg's idea and the graphical departments in connection with it, if properly applied. But in like manner an illegal application of them may act in the most destructive mood. It is like the lancet in the hand of a clever surgeon, where it becomes the means of saving the life of the patient, whilst in the hand of a person who does not understand to handle it, it turns out to be the most destructive weapon. It is sad, however, to perceive that the pernicious tendency is so near at hand, wherefore its nobler endeavours are easily ignored, especially if problems are undertaken to be solved by which blame is easily excited: that by multiplying artistic-scientific objects by means of an ennobled press — though it cannot be denied that they are destined by nature to become the joint property of man — the value of a unicum would become less, or some people might lose their trade.

This sentence was passed on the press already more than 400 years ago, and is renewed to this day with unchanged zeal. It is, therefore, not to be wondered at, if under such circumstances only a very few of the graphical departments of art are known among the public, and even those only by name. Many a one can scarcely distinguish a lithographic production from a wood-cut, from a copperplate-engraving etc., and yet no technical employment deserves more the attention of man than this, for it is to every one of use, from the earliest youth up to the latest age, at all hours and times.

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The London industrial exhibition has, therefore, bestowed attention to all departments of trade, and, in consequence, also to printing; it has given all the industrial parties of the globe an opportunity of publicly exhibiting the productions of their industry.

The imperial institution that is confided to my direction has also obeyed this honorable call — and I may say it unhesitatingly, with a feeling of joy, although there was some fear that a comparison of our productions with those of the exhibitors of other countries might cause a very serious moment of criticism.

But the final result turned out to be more favorable than I thought. The jury bestowed in the XVII. class for „graphical arts" only one council-medal, and that one to the imperial Court and Government printing-office at Vienna alone. This distinction was so much the more honorable, as English and French jurymen had the most decided share in the distribution of the prizes. However, the reason of this happy result, though it came unexpected, is very near at hand: in all other printing establishments the graphic arts are each carried on separately, but all together are not nursed in any other establishment within or without Europe.

I tried to carry out the original idea of representing the whole department of graphic art with the different productions of the imperial printing-office, and I take herewith the liberty of presenting to this honorable meeting, by means of this apparatus, a part of the objects exhibited at London; this apparatus has the peculiar quality, that if it is closely examined, more knowledge may be derived from such an examination in a very short time, than could otherwise be obtained by the study of many months.

In the first and second drawers of this chest are specimens of printing and the letter specimens in 4 folio volumes, namely, —

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In the first volume.

German types	24 degrees.
German broadside types	13 sorts.
Half fat-faced German types	7 degrees.
Fat-faced German types	10 „
Ornamented German types	23 sorts.
Gothic types	13 degrees.
Bible Gothic types	7 „
Small Gothic types	7 „
Ornamented Gothic types	8 sorts.
Court hand	14 „
Black letters	4 degrees.
Midolline types	8 „
German Script type	1 degree.
Short-hand writing or stenographical signs	1 „
Musical notes	1 „
Calligraphical ornaments, rules and braces	15 degrees.
Borders	10 „
Corner pieces and closing rules	86 sorts.

In the second volume.

Roman types	23 degrees.
Italic types	16 „
Half fat-faced Roman types	6 „
Fat-faced Roman types	9 „
Fat-faced Italic types	6 „
Skeleton Roman types	4 „
Egyptian types	8 „
Small Roman types	12 „
Didot's Titling Capitals	18 „
Ornamented Roman types	176 sorts.
Initial letters	4 degrees.
Roman broadside types	38 sorts.
English Script types and stenography	11 degrees.
French Script types	7 „
Book-types of the middle ages	10 „
Gutenberg types	5 „
Ornamental letters after specimens of former centuries	5 „
Letters for the use of the Blind	6 „
Total	616 d. and s.

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In the third volume (I. section): **foreign texts.**

Albanian in two forms.
Anglo-Saxon.
Arabic.
Armenian (Roman).
„ (Italic).
„ (ornamented).
Batta.
Bengalese.
Birmanic.
Bisayic.
Bugis.
Chaldaic.
Chinese.
Cingalese.
Ciryllic.
Cuneated letter.
Devanagari.
Estrangelo.
Ethiopian.
Etrurian.
Formosanic.
Georgian.
„ (Bible letter).
Glagolitic.
Greek (Roman).
„ (Italic).
Guzuratic.
Hebrew, German.
„ Merubas, with points and without.
„ German Rashi.
„ Talmudic Rashi.
„ Spanish-Levantine.
Himjaritic in two forms.
Hindostanic.
Japanese (Katakana).
„ (Firokana).
Javanese.
Kabulic.
Karnatic.
Kashmerian.
Keltic.
Koptic in two forms.
Maghadic.
Malayalam (Grantham).
Malayan in two forms.
Mandschu.
Moeso-Gothic.
Mongole.
Monogramme.
Multan.
Old Greek.
Orissic.
Pali.
„ Nr. 1.
Palmyrenic.
Passepa (square letter).
Pehlvi.
Phenician in two forms.
Runic.
Russian (Roman).
„ (Italic).
Ruthenian.
Samaritan.
Shikh.
Siamese.
Sindh.
Syrian.
Tagalic.
Tamulic.
Telingic.
Tibetanic.
Tschirokisian.
Turkish (Neschi).
Zend.

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In the third volume (II. section): **foreign alphabets.**

Açoka-inscription.
Ahom.
Albanian (2 forms).
Allahabad.
Anglo-Saxon.
Arabic.
Aramaic.
Armenian.
Assam-inscription.
Batta.
Bengalese.
Birmanic.
Bisayic.
Bugis.
Camboja.
Chaldaic.
Chinese (joined).
„ (separate signs).
Cingalese.
Ciryllic.
Coreanic.
Cuneated letters.
Demotic.
Devanagari.
Ethiopian.
Etrurian.
Estrangelo.
Formosanic.
Georgian (2 forms).
German book-types from the 6. to the 14. century.
Glagolitic.
Grantham.
Greek (Rom. and Italic).
Gutenberg.
Guzurate-inscription.
Guzuratic.
Hebrew, Merubas.
„ German Rashi.
„ Talmudic Rashi.
„ Spanish-Levantine.
„ German.
Hieratic.
Hieroglyphics.
Himjaritic (2 forms).
Japanese (Katakana).
„ (Firokana).
„ (Chinese signs).
Javanese.
Kabulic.
Kabylic.
Karnatic.
Kashmerian.
Kayti-Nagari.
Keltic (2 forms).
Kiousa.
Kistna.
Koptic.
Kufian.
Kutila.
Laos.
Lykian.
Maghadic.
Mahrattic.
Malayalam.
Malayan.
Maldivian.
Mandschu.
Moeso-Gothic.
Mola.
Mongole.
Multan.
Nerbuddha.
Numidian.
Old Greek.
„ Hebrew.
„ Italian.
Orissic.
Pali (Nr. 1 and 2).
Palmyrenic.
Pehlvi.
Persian.
Phenician.
Punic.
Randscha.
Runic.
Russian, Serb., Wallach.
Ruthenic.
Samaritan.
Shikh.
Shyan.
Siamese.
Sindh.
Syrian.
Tagalic.
Tamulic.
Telegraphic signs.
Telingic.
Tibetanic (and Passepa).
Tschirokisian.
Western grotto-inscript.
Zend.

Bohemian, Danish, Dutch, English, Finlandish, French, Hungarian, Illyrian, Italian, Lettic, Polish, Portuguese, Spanish, Swedish, are composed with Roman type, for which the required accented letters are extant.

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In the fourth volume: **Specimens of all the other graphic arts.**

Woodcut. Copies of older woodcuts and some after Albrecht Dürer. A collection of seals. Illustrations to works and for festive occasions. Landscapes and historical pictures. Four leaves of religious representations, drawing by Professor Führich.

Chemitypy. Representations of the localities of the imperial Court and Government printing-office at Vienna. Illustrations to works.

Steel and Copperplate Engraving. Illustrations to several works. Cards for festive occasions.

Guilloche-making. The Emperor Francis Joseph I. Representation of the various applications of the guilloche-machine.

Lithography. Drawing with pen and ink, the titles to A. Auer's collection of Lord's prayers. (They are in the portfolio to the IV. volume.)

Lithographic colour-printing. Flowers. Head for study. Two flower-pieces. One fruit-piece. The Emperor Joseph II. Representations from a code of law. (They are in the portfolio to the IV. volume.)

Chemigraphy. Several specimens.

Galvanoplastic. Copy of a copperplate and a galvanographic object.

Stylography. Illustration to a work.

Galvanography. The Departure. (A copy of the plate in the galvanoplastic department.) A head after Titian.

Natural self-acting printing process. Agate-stones, etched by Professor Leydolt, and printed on the common printing press. Agate-stones, etched in the same manner, copied by means of the galvanoplastic process, and printed on the copperplate press. Petrifications of fishes, after a recipient by the imperial librarian J. Heckel, copied also by means of the galvanoplastic process, partly stamped and partly printed in colours. Flowers and plants printed in colours at the request of Mr. W. Haidinger, counsellor of the section, after recipients by Dr. Const. v. Ettingshausen and Prof. Leydolt.

Glyphography. Emblems of typography.

Hyalography. The imperial Austrian eagle. Large landscape.

Photography. The tower of St. Stephen at Vienna. Gutenberg. Genealogical table of languages.

Mycrotypy. A silk-worm breaking forth from its egg; represented by means of photography, three thousand times larger than nature.

In the third drawer all the thirty modes of printing are collected which may be applied in the multiplication of the human thought.

In the fourth, fifth, sixth and seventh drawers the colour printings of the institution are collected, drawn up like oil-paintings.

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We will now commence with the different modes of printing, and therefore name the four principal polygraphic departments of art, namely —

The raised printing, with the punch-cutting, the letter-foundry, printing as well for those who see as for the blind, stereotyping, typometry or the calculation of room, the knowledge of types, xylography or wood-engraving, chemitypy, glyphography;

The concave printing, with the chalkography, the siderography, galvanography, stylography, hyalography, engraving, guilloche-making, diminution of engraved plates;

The chemical printing, with the lithography, the chemigraphy, anastatic, chromo-lithography or colour-printing in general;

The natural self-acting printing process, with the galvanoplastic, the Daguerreotypy, photography, and microtypy,

and will join with an explanation of the same our opinion with regard to their practical application in a mentally ennobling, as well as in a material or profitable point of view.

The first department mentioned includes all that man may want in the sphere of nature, art and science; and the creation of Pinakotheks and Glyptotheks, and even of whole museums for natural history and archaeology, might be ascribed to the multiplying apparatus, besides its establishing libraries.

Hitherto the press was occupied with the printing of books and pamphlets for every day use and with the representation of pictures in a more limited sense. What one party printed, another party tried to draw within the extend of his activity, and, in consequence, this competition caused some interruption in business, so much the more so, as the department of the graphical branches of art is too limited as it is, and excludes the multiplication of numerous objects which all belong to the printing department.

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Daguerreotypy. Every one knows that Daguerre has invented the wonderful art of light-printing on silvered plates. But as long as his process remained without improvement, the transitoriness of the picture, as well as the circumstance offered a great obstacle, that of the picture thus obtained, unless it is fit for etching, no copies can

Photography. be taken. This circumstance caused Talbot to invent a process by means of which his productions are furnished on paper. The defects of paper in general, but especially owing to the heterogeneous materials of which it is composed, leave yet large space for improvement, and, on that account, according to Nièpce, glass has been made use of. We behold here a glass-plate, on which there is a drawing of one of our grandest specimens of Gothic architecture, namely the tower of St. Stephen, as a negative picture, from which the positive picture has been taken which the reader now beholds.

Who would be able, and what means would be required, to produce all these millions of details by means of our imitative organs, namely the eye and the hand!

Microtypy. In the same manner as we see this splendid monument of architecture diminished to any required size, photography or light-printing furnishes every microscopic object enlarged to any size, and I have here a silk-worm breaking from its egg, seen 3000 times larger than nature by means of the microscope, according to the recipient of Mr. Ernest Heeger. These negative and positive copies may be multiplied without number, so that such pictures might be subjoined to every printed book.

Photographical pictures made fit for printing. But not content to produce photographical pictures of the size of 21 inches (!), we pursued our aim by etching them, in order to obtain plates fit for printing by means of mechanical multiplication through the printing press — and the etched plate before us, which has been already multiplied by means of the galvanic process, proves that the problem which has so long in vain been endeavoured to be solved is now soluble — though by a different method than that pursued by the deceased Professor Berres for

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the purpose of making Daguerreotype plates fit for being printed in the common press.

Photography or light-printing could, with the exception of being applied for the production of portraits, a long time obtain no more extensive field for activity, although a great number of people made use of the photographic apparatus. This splendid department of art, which has a far superior tendency, has, from the very beginning, been made use of for a limited purpose, and is even to this day applied by some artists for the sole purpose of earning money, in such a manner that through those defective productions almost every higher aim has been suppressed.

This did more injury to the art of Daguerreotyping than it derived benefit from its rapid extension in the above named manner. The same was the case with the photographic pictures on paper, which were influenced by another disadvantage, namely that they required a painter, who, generally speaking, from individual misconception or from want of practice, entirely spoiled those intimations which the light had given in a defective manner, or which the paper had received in too faint a manner, whereby the likeness of the picture was generally injured. It often happened that the photographer was no distinguished painter, or that the latter was no photographer. In such cases the necessary agreement — or rather the indispensable fundamental principle of judgment — was wanting; and thus it happens that productions are exhibited here and there in public places, which, if the splendid art of photography carried not within it a higher destiny and a more extensive application, must have destroyed it long since. Fortunately some distinguished photographers trod on a different path. They copied architectural monuments, statues, even landscapes etc., and by this means they did one step in advance of the unfathomable pit of their activity, and it is owing to this extensive application that the existence of photography will always be safe, and even reach a higher aim than all other multiplying methods. Photography designs the universe and all that is contained in it; it

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furnishes the most correct copy of man and all that surrounds him, whether it be living or lifeless. Let us pass through the temple of Nature, Art or Science, — there is nothing that is not offered to man with striking resemblance.

From the smallest grain of sand up to the largest monument, from the almost imperceptible animal up to the gigantic animal, its designing eye reaches. The wonderful apparatus need only be fixed on a high mountain, and the moment its glass is opened, all living and lifeless objects, as far as the human eye reaches within the horizon, appear copied on the plain — whilst the objects copied have not the least notion that they were all the time in the power of some one else who copied them to his fancy. Let then the apparatus be fixed in the plain, so as to command the heights whence it before commanded the plain, and all the surrounding heights will by this means become the property of the camera, of which otherwise the very outlines would have been inaccessible. If we are anxious to preserve the memory of any particular monument, we need only fix the apparatus near the same, and within a few minutes it will furnish what connoisseurs would not have been able to furnish in an equal number of days — and in so correct a copy — whilst language, if ever so flowery, would not have given us so correct a notion of the object required. Before we have time to compose an explanatory catalogue, the photographic apparatus has already furnished a copy of the object in such a manner, that the admiring connoisseur cannot leave off looking at it with the magnifying glass.

But now we will pass over to a more extensive department which is interesting to everybody: Let, by degrees, the whole world be furnished in pictures — this would give employment to thousands of photographers, and will give millions of purchasers an opportunity to collect it, as far as required, within a small space of their rooms. And first and foremost, let us commence at home: surely our paternal country is so rich in treasures of art, that one grows almost afraid of its superabundance. But

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the natural curiosities of our native country, as well as its productions of art and-science, shall become the property of every patriot: they shall be seen in palaces and in the abodes of wealthy citizens — and from the cheapness in its technical execution, even in the village-school and in the house of the peasant, if we pursue the method that nature intimates for its accomplishment. The most remarkable thing is that Nature furnishes us gratuitously with the originals, so that we need only take what we please, and yet — it will hardly be credited — we did not take as yet, whilst manuscripts, and other productions of the human intellect that are of less value, are purchased at high prices every day.

Let us place ourselves in the position of a traveller. How glad would be every one of us if, when passing through towns or spots in our home or in foreign states, we could obtain views of all the remarkable objects we beheld — that is to say if they were to be had at such reasonable prices as to be accessible to a person without enormous wealth. The Frenchman, the Englishman of ordinary means would then be able to carry Germany in an album, the German of ordinary means, if travelling, would be enabled to carry England, France etc. in an album — whilst at present travellers must be satisfied with single views — steel-engravings or lithography at high prices — which are often anything but like nature. Photography, it is to be hoped, will gain the triumph in this combat, and will in time supply us from its cornucopia, without reserve, with everything that is accessible to the ray of the sun or to any artificial light — from the deepest pit of the earth up to the highest stars! Or if we get a telescope that reaches above the stars, and it is joined to the photographic apparatus, we promise to furnish you with pictures from infinite spaces.

Printing for the Blind.

From printing by means of the rays of the sun or by means of light, we will now proceed to the very contrast, namely to the printing for the use of the unfortunate blind persons. Having

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become acquainted with the pains that are taken and the improvements that are achieved by foreign nations with regard to the printing for the use of the blind, I had an alphabet cut which does not differ materially from that of seeing parties, whilst it offers advantages to the blind which are missed in the alphabets which the Americans, English, and French have adopted for the use of those unfortunate persons. The blind make use of two kinds of letters, namely the so called prickly letter, which he uses for his correspondence and for all sorts of writing, and the letter used for printing, with edged surface. This small box, the outer cover of which is provided with brass bars for making him write straight, forms the writing-apparatus for the blind. As often as he impresses a letter in the row on the paper which rests on a half-soft support below, he takes a second letter, ranges it to the type that yet sticks in the paper, and continues in this manner, until the whole page is printed.

I have had cut not only the signs of all the Western languages, but also the signs of all the principal Eastern languages, in order that, if ever institutions for the blind should be established in the East, there may be no further obstacle to the formation of their letters. In the same manner musical notes, geometrical signs, ornaments etc., are prepared to serve for the blind as well as for those that see, and it requires only a little encouragement so that the blind may be provided with all sorts of books and other aids, as this is the case in America, where the blind is daily provided even with a newspaper printed for his use.

Having prepared the required types and other utensils that enable the blind to participate in all the advantages that are offered by art and science to those who enjoy the light of their eyes, all that remains for us to do is to replace that which those that see perceive by means of the eye, but which the blind perceive by means of the feeling — so much so that, with the exception perhaps of the difference of colours, they are equal to those that see, and as far as more acute perception is concerned, and retaining

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impressions more fixedly on the memory, they even surpass those that see. Is it not, therefore, the duty of the press to make an end of a darkness that has lasted so long? In our present age, where all sorts of humane endeavours rank uppermost, where we show all possible sympathy to individuals who on account of the crimes they committed have forfeited all sympathy of the human society, we can surely not overlook the poor blind, who gives us so many wonderful proofs of the activity of his intellect, if his mind receives the required cultivation.

Not every one of the many thousand blind persons living both in our native country and in other states, can be provided for in a proper institution, as not every one has the means of paying the necessary outlays. These poor creatures remain, therefore, without education, and they are surely the most pitiable beings extant. It is not without compassion that we can look on such an unfortunate blind individual among us. Those who have early been put into an institution, and have been instructed in religion, reading, writing, and different kinds of work, have the advantage that they can employ their time usefully. They can write by the aid of the apparatus, in the manner just shown by me, and thus satisfy this want with blind or seeing individuals. But they are yet in want of the most important thing, namely a well-sorted library, which extends over all the auxiliary sciences, with which the blind would only then become acquainted.

The press, established in the manner above described, can supply them with it, if the printer claims it for that purpose, and if the required capability of return be extant. There are small provinces, which are provided with printing-offices for those that see, but the 30,000 blind individuals of Germany *) are not yet provided with a printing-office for their proper use!

*) According to Klein's assertion there are more blind people extant than we are aware of or are generally inclined to believe; in the countries only where German is spoken, there are about 30,000 blind individuals, so that on an average 1 may be counted for 1285 inhabitants. If we add hereto those of the rest of Europe, Hungary alone counting about 24,000, then the blind of the states of Northern Africa and Egypt, the blind population of which is in proportion still more numerous (according to modern travellers 1 blind person may be counted there for 150 inhabitants), Barbary and all the other Asiatic nations, we behold a nation of blind individuals among whom there are, no doubt, many persons of distinguished intellect, but whose mind is at present buried in double darkness.

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Let there such an institution be established to-day, and it could supply all Germany with its productions, since no establishment of the kind exists as yet. It would be equally as profitable as the establishments of England and America, however incredible that may now appear. Our important geographical position, the net of railroads that is extending in every direction, our very Danube is a convincing proof, that the press of Austria is not only occupied with the inhabitants of its own country, but also with those of all the neighbouring and even of far distant countries — as long as they are obliged to do without such a press, which will be the case until our own press, turning out to be a profitable concern — which will ultimately be the case — excites our neighbours to imitation!

In the government establishment confided to my care, I have placed the germ in the ground, I have sown, in the most unwearied manner, twelve years long, but the time has not come yet at which the seed could have sufficiently blossomed. I acted in accordance with the maxim, that where the energy of private individuals turns out to be insufficient, it is the duty of the government, in imitation of so many preceding examples, to lend its support; for in Austria the case differs from England and America, where every kind of enterprise is commenced by private societies and carried out by them in the most energetical manner.

If we consider that through the possession of our Western and Eastern alphabets and types nearly all nations are drawn within the marks of our boundary, this circumstance ensures to us a far more extensive field for action than I hinted at before in speaking of Austria or Germany. The East, in particular — where as yet there exist scarcely any printing-offices — must occupy our attention foremost, and it would be most interesting if, besides other articles of export, the books for the use of the blind would be commenced with, in order to let such for persons that see follow in increased measure. What gain would not the printers of England and America derive, if they were in possession of our

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types! As a proof how our foreign types are sought after and made use of in England — though there is such an abundance in alphabets there — we may mention the circumstance that in the year 1851 we furnished, according to the preface which we here quote *verbatim*, we furnished the famous booksellers Bagster and Sons of London with the types to enable them to accomplish a scientific work *).

Lithography, Engraving on Stone, or Chemical Printing.

We now come to Sennefelder's splendid invention — Lithography, or rather chemical printing, which makes us acquainted with the stone in its wonderful application. If the stone is written upon with greasy ink, or if a paper covered with such a fluid is impressed on it, we obtain a perfect autograph. Every figurative representation may be obtained in the same manner. The greatest artists have already got hold of the stone, and have confided the creations of their mind to this material, either in common print — by means of the pen, chalk or pin — or by means of colour printing, like oil-paintings.

At first lithography was mostly applied to the printing of official and commercial objects, and autography or the reprinting of written pages formed the greater part of the ordinary work.

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*) THE BIBLE OF EVERY LAND.

A history, critical and philological, of all the Versions of the Sacred Scriptures, in every language and dialect into which translations have been made: with specimen portions in their own characters; and ethnographical maps. (Dedicated by permission to his Grace the Archbishop of Canterbury.)
London: S. Bagster and Sons, 15, Paternoster row; warehouse for Bibles, New Testaments, Prayer-Books, Lexicons, Grammars, Concordances, and Psalters, in ancient and modern languages.

After Specimen portions of the different Versions of the Scriptures had been procured and prepared for this Work, it appeared desirable, in order to furnish every available aid towards the examination and comparison of these Specimens, to provide if possible a series of Native Alphabets. But here a serious difficulty presented itself. Many of the characters in which the Specimens are given are little known even to the learned in Europe, and some of them have never before perhaps appeared in print in this country. There is therefore no work to which the student can refer, if he wishes to ascertain the relative value of the widely-differing Alphabets in which these Specimens are printed.

Every effort was made to procure a complete series; but as it was found that very many Alphabets could not be obtained, the design of supplying the comparative Tables was about to be relinquished.

It being however well known to philologists that in the Imperial Printing-office at Vienna there exists an unrivalled collection of foreign types, formed by the skill and untiring diligence of the Imperial Commissioner, M. Alois Auer, the Publishers ventured to represent to the Imperial Government the difficulty experienced in enriching the „Bible of every Land" with the necessary Alphabets, and solicited permission to purchase from the Imperial Printing-office the Alphabets not procurable in England.

This appeal was immediately responded to; and with great liberality, His Majesty the Emperor at once directed a complete series of the Alphabets of all the types used throughout the work, together with the powers of each letter, to be prepared and forwarded free of cost for the use of the present work.

The Alphabets, therefore, which the Publishers have the satisfaction to include in their work, are printed from types cast and prepared in the Imperial Printing-office at Vienna, and presented by the Emperor of Austria as a contribution to the completion of the „Bible of every Land."

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By means of drawing with the pin more neatness is effected, and not only is the writing executed in this manner more sharp, but by this means there are also figurative representations executed which resemble copperplate engravings. But by means of drawing with the pen a more independent execution is effected. The paper is not used first for the preliminary representation of the thought, which is transcribed afterwards to the stone, — but the artist commits his thought immediately on the stone — which most eagerly absorps the Indian ink used for this purpose — and thus he furnishes his artistical production directly as a perfect representation. Our ingenious Peter Geiger has given us sufficient proofs of the powerful expression of his fancy, as well on paper as on stone, and convinced us what can be accomplished by means of drawings with pen and ink. Drawings with the chalk-pencil gain a more extensive field every day, which is not so applicable to any other material than stone. How manifold is its application, we may perceive from the memorials of the academy of sciences that appeared. Flowers of the most beautiful blending of colours, butterflies, landscapes, petrifications, shells, geognostical investigations, maps, architectural monuments, mosaic pavements, ancient codes, objects of art of the most different descriptions, the diseases of the skin of the human body in its innumerable variations; paintings in oil-colours as well as in water-colours, after different masters, make us acquainted with this mode of printing; and how great however the advantage may be that has already been derived from this art, it bears not the least proportion to the results that might yet be expected from its proper application. In the locality appropriated to the exhibition of the productions of the imperial printing-office, we perceive a long range of chromo-lithographs which represent a small gallery of artistic prints of all kinds.

But if we pay a visit to the picture-gallery in the Belvedere at Vienna, in the Pinacothek at Munich, to the one at Dresden, or if we go to Berlin or Düsseldorf, what an accumulation of

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innumerable material do we not find there for imitation by means of the chromo-lithographic press! If we glance over the department of history, how much shall we meet with that has not been depicted yet, and how much that has already been delivered to oblivion! If we glance over our other collections of art and important monuments, how few shall we find that have been copied, to remain as memorials for the benefit of either the native or foreigner! In what other country are greater beauties of nature to be found than in our extensive empire, but where are the figurative representations of them?! Where do we meet with a figurative natural history, which, in handsome representations and cheap editions, would make boys and girls acquainted foremost with their native country and then with foreign countries? Why are men tortured — commencing from boyhood through their youth up to manhood — with the study of numerous volumes that only serve to fatigue them and make them lose all pleasure for study, if they could acquire the same knowledge in a more natural and agreeable manner in a hundredth part of the time that is required at present — whilst the desire of acquiring new knowledge would by this means be raised, instead of which the study is now effected by means of coercive measures, in order that the acquired knowledge may be easily forgotten again, and thus time, trouble, expence, and a precious human life be wasted in vain?

A few moments of contemplation over a flower that is prettily painted, or printed without blemish, — or over any other object that is represented figuratively — furnish to the eye and the memory what the child is unable to learn, amidst tears, from a description many sides long. Let it not be replied, There is already many a thing of the kind extant; for I should be obliged to say again, True, but in homeopathic doses. For a few wealthy families, perhaps, there are picture-books and figurative representations extant; but let us ask — without mentioning that their execution is often anything but correct — what their price is, and we shall find that, if for example a folio-leaf of paper on which mushrooms

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or venomous plants are represented be charged a florin or two, none but wealthy people are enabled to buy it, and the poorer classes — therefore the majority — are not benefited by such publications.

It can scarcely be conceived, why the superabundant means of the ennobled press should have been hitherto overlooked. But this neglect did not remain without injurious consequences. What comparative ignorance will be met with, if we question the unlearned youth on matters foreign to the profession to which he devoted himself! How unpleasant are the observations that less wealthy parents make with regard to their own information; how sad are the perceptions that will be gathered by well-informed people on examining the unlearned children of poor families! Let us cast a glance over the state of apprentices, and we shall find that they do not possess the most indispensable information that might be expected of a child, if the press had supplied the required school-books. But let us quit the department of the useful and let us talk of the most indispensable — how are children taught religion, which is the moral basis of the whole human life, and what do they retain of the numerous octavo-volumes which they committed to memory without the least reflection? — and the reply will be — according to the experience of persons well-versed in such matters — a very decouraging one. How are children taught the geography or the history of their native country? In the lower primary-schools these departments are not taught at all, and in the higher classes in so slovenly a manner, that no practical use is derived from the tuition. Where is, therefore, the patriotic enthusiasm to come from, or whence self-confidence and consciousness, if they are not inoculated in earliest youth on the minds of the people by means of figurative representation? But unfortunately, this evil does not remain stationary — it increases continually — and the next step from ignorance of one's own country is our over-estimation of foreign countries.

Many a one who has remained unacquainted with his home, travels abroad, and finds — because there he sees and reads

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what at home he has neither seen nor read — everything by far superior! However irrefutable this assertion is, it may perhaps appear too severe, and we will therefore cast a deeper glance on our press with regard to the department „illustration“! Let me be permitted to examine some of the sign-boards in the chief public places of Vienna. How few native pictures do we meet with in proportion to the number of foreign ones! Where do you behold one of our great regents or heroes of the times of yore? Where do you find the grand features of the history of our native country? whilst you need only advance a few steps and you will be sure to behold on almost every sign-board the features of our enemies — however memorable they may be in their own countries. It will perhaps be replied. They are perceptible, because they find more purchasers — that is the very circumstance to be regretted; for from the merchant's shop thousands of representations which ought to be strangers to us, are transplanted to the places for public amusement or to the walls of the citizen, to the room of the peasant — and thus the seed of patriotism is sown by the press! It would be unjust to attribute the fault to the print-seller; the native press does not supply him with anything superior, it is supplanted by foreign productions. It would be still more unjust to reproach the majority of the public with indifference to its native treasures of art; for if we observe picture-galleries and scientific collections on the days on which the public is admitted, we shall find there a number of persons not less surprising in proportion than in Paris at the Louvre, in London at the British Museum, or in Rome at the Vatican. And we might even remark with equal justice, that these last named institutions have not been more active in the publication of their works of art by means of the ennobled press than we. But let us make the beginning: let us multiply our historical and artistical medals, and let us furnish them at a price, that the walls of the rooms of the citizens and peasants may by degrees become ornamented with the representations of noble and patriotic deeds, so that the pictures of foreign heroes may be in

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return supplanted by our native ones, and let the former be placed there, where our history is silent and does not find an inch of space for its representation.

Let us aim at establishing cheapness to such a degree, that even the less wealthy tradesman — instead of the passing enjoyments in places for public amusement — may, by degrees, be enabled to purchase pictures that would give him more lasting pleasure, whilst they would serve to instruct and emulate his children; and we shall — just as we meet in towns which have taste for the fine arts, like Munich, Dresden, and Düsseldorf, private individuals in possession of small collections of the best masters — at least in some time to come, find those choice colour-prints on the walls, which, considering the reasonableness of the price, these parties will like as well, as the other parties like the rare productions of the great masters.

But there is one favorable circumstance I must not pass over. Every year a number of individuals quit the academies for the plastic arts who have not attained that kind of excellence in the department they have chosen, which would enable them to claim an independent position as artists; and they find still more difficulty in maintaining themselves by a common trade. If the graphical departments of art were made use of for the purposes already intimated, every year might be expected to bring forth a number of young, hopeful artistical mechanists who could be withdrawn from the proletarian artists. If these academies in principal cities received a proper impulse, that aimed at more universal usefulness, I should think that the time has arrived at which it would be advisable to establish such an artistical institution as the point of issue and point of contact for the cultivation of the people, the profit of which — if appropriately conducted — considering that the number of purchasers would amount to nearly 37 millions, would be very considerable.

Let us consider that the public in Austria does not consist of people whose fondness for reading and sights is on the decline, — but that these qualities might rather be expected to increase in

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proportion to the development of its interior and of the neighbouring countries to the East and to the North — and the department of polygraphy, or the thirty different branches of art carried on in our institution, will appear — without any kind of competition — like an immeasurable country the fields of which have to be sown yet, but the ground of which is so fertile, that the seed begins to blossom in by far greater number and with much more luxuriousness than in the ground already gained.

Anastatic printing, chemigraphy.

Having tarried rather long at the department Lithography, we shall be short now respecting anastatic printing, or the renovation of old prints, manuscripts, drawings; for there are not many persons in possession of those precious objects, and the few proprietors being naturely parties who exclusively occupy themselves with the study of that particular department, our remarks are not of interest to the public at large.

However pleasing the thought in itself may be, that by the newly invented means for renovating, every print or manuscript of which only one copy is extant may be multiplied — and thus objects may at least be preserved in their genuine form, because they can be deposed in greater number and at different places, and because many persons can make use of them at the same time — yet there is something in this progress that is alarming. Unwillingly the hoary librarian or keeper of archives perceives, that the sole copy of a print or manuscript in his possession might now be exchanged for a forged one, and thus mistaken. Unwillingly the artist perceives, that the product of his industry — his original — is now subject to be imitated by one who has not the capacity of creating an original in the manner in which he does, but who is now enabled, by much simpler means, to copy his original. Unwillingly public authorities perceive, that documents or other important papers are copied, as by this means not only abuse but even greater dangers might be caused. But all this is in vain!

Imitation is a daughter of the eternal law; nothing is spared by it; and like the artist or scholar derives the creation of his

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mind not only from himself and from his own property, but from all that surrounds him, — like he gratuitously gains from nature, — in the same manner, as soon as he has furnished something that is worthy of imitation, his production ranges itself to the creative originals — and only in that case imitation can and must be counteracted beforehand, for Nature is not less liberal with remedies, if we only pursue her hints more closely.

Let us aim, therefore, at that kind of multiplication which not only does not prejudice the property of others, but which is also of advantage. Let us multiply everything by which the extention of artistical and scientific knowledge is promoted, and which, besides being profitable, leads to the circulation of such treasures. Let us, first of all, make a catalogue of them and have it printed, in order that thousands of persons may by this means become acquainted of their existence, and that it may become impossible to lose them, without our having at least some recompence for their loss. Don't let us send hundreds of scholars to perform long journeys, for the purpose of enjoying the sight of such rare prints or manuscripts during a few days of vacation, but rather let us hand over such rare objects to every principal town, and try to effect an exchange for them, so that our native scholars employed with researches of that kind need not be obliged to seek our monuments elsewhere and to study history in foreign countries.

One invention sometimes partly supplants another — or rather, appropriates that to itself which is more easily produced by a different mode of proceeding — such was the case with the stone: it was soon discovered to be too heavy; its fragility produced the desire of more security; the large space that was required for keeping the objects drawn upon it, offered difficulties; and at last the apprehension, that the stones stored up in the few places where such especially fit for the purpose had been found hitherto might be exhausted, caused us to discover a means of supply in zinc-plates, which already at present suffice for certain kind of work, and the application of which might be still more extended. For

Zincography.

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engravings of all kinds, zinc-plates serve the same purpose as stone, they being excellently fit for etching. Considerable progress has also been made upon them for the purpose of reprinting and drawing with pen and ink. Even drawings with chalk-pencil and with Indian ink have been successfully tried upon it, and — if once the zinc-plate is entirely to supply the stone — this circumstance will grant us the inestimable advantage of being able to store up, like stereotype plates, whole volumes of such drawings, for the purpose of printing new editions, in a proportionably small space.

Hitherto stone-plates have only been used on the lithographic press, and zinc-plates on the lithographic and on the copper-plate press; in both ways the number of copies that could be obtained in one day was very small, on account of the slow progress afforded by these kind of presses. Elevated etching on stone and zinc were therefore tried, in order to obtain a plate, by means of reiterated casting, which — after the etching is completed and a copy of the engraving taken — would in the same space of time furnish ten times the number of copies on the common letterpress; and by these means a medium between steel-engraving and copperplate-engraving, and between the manner of engraving used for the lithographic stone and that used for wood-cuts, has been attained. Chemitypy.

Where the disadvantages of the stone lead us to the advantages that zinc-plates afford, and where the manner of raised etching appears to us more favorable, there let us avail ourselves of the benefits afforded by this invention, let us furnish the printing-machine with works, plans, and maps of ancient and modern times — and touching upon this subject we cannot forego to express the following remarks. The printing of maps in Austria is a department which is not carried on with that degree of energy which, from the abundant means that the presses of modern times have at command, the public might expect. The typographical maps executed at Vienna are too defective, in a technical point of view, those executed by means of lithography or copperplate printing are by far too expensive. If we compare with them the maps

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produced for the use of the people in Germany — or even in the most expensive country, in England — we shall find, that we can no more compete with the moderate price of these productions than with that of the maps produced in America by means of cirography. Let me not be misunderstood: I mean, besides their superior quality, their cheapness. — The excellent maps of the staff, published by the imperial geographical institution at Vienna, may rival, as well with regard to the correctness of the surveying as with regard to the exactness of their execution, with any production of that department — and, as a just and honourable acknowledgement, the large council-medal for class VIII. was awarded to them at the London exhibition of 1851 — but on account of their high price many amateurs in that department are still unable to procure them. Nor is it possible to reduce their price as long as they are produced by the expensive method that is applied at present in their execution. We will, therefore, talk less of these maps, and bestow our attention on the proper maps for the people. How inferior are our school-maps, in proportion to the just claims which the public are entitled to make on the press of the present day, and how grievous is, therefore, to the patriot the sight of the considerable importation of this article from other countries! Should we not justly expect, that — according to the present state of our polygraphy — we should be in a position to carry on a considerable export trade with that article? What is to hinder us from so doing? Whilst at present the natives of the Austrian empire are obliged to gain the geographical information respecting their home — and often in an erroneous manner too — from foreign sources, and in this manner considerable sums of money take their course into channels from which we derive no pecuniary gain. If we wish to remedy this inconvenience, and at the same time seriously to compete with foreign publishers of maps, we must adopt a mode of production which experience in the graphical departments of art advises as being the best — so that, after the contents of the original plate is as correct as possible, the changes occasioned by time

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may easily be made — in this manner we shall not only furnish something that is superior in a technical point of view, similar to the productions of Perthes at Gotha, of Jonghaus at Darmstadt etc., but also at a moderate price, whereby the enterprise and the purchasers will be gainers and satisfied.

Chalcotypy.

The process of raised etching has, therefore, been also extended to copper-plates; plates are gained by means of the galvanic process which are much more durable than zinc, and thus considerable progress has been attained as well with regard to the production of greater numbers, as with regard to moderate prices, but by which method only drawings and figurative representations can be made accessible for the cultivation and extention of the large masses of the public.

Chalcography.

The drawings and figurative representations which, before the invention of lithography or chemical printing, one did not like to multiply by means of wood-cuts, were done in a softer and finer, but not less efficacious manner, by means of copper-plate engraving, which, on account of the limited number of original copies and on account of the slow progress of the proceeding, came very expensive.

Siderography.

Only in modern times the treatment and etching of steel-plates has been invented. These furnished, with regard to duration, a ten times larger number, but if a thousand times larger number was required, it was still necessary to engrave as many plates as that number required. The invention of impressing a steel-engraving, by means of mechanical force, into softer metal, could be applied by means of the so called transfer-machine, but only in common productions and small sizes — such as paper-money — but could never be accomplished in a completely closed picture with objects of larger size.

The transfer-machine not being able to be applied to larger artistical productions, people were obliged, when numerous editions were required, to make shift with copies of the engraved plates; and they were often glad if the second or third plate —

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in spite of the enormous expenses they caused, and though they exhausted the perseverance of the copper-plate engraver — even though they did anything but resemble the original plate. At last a desirable means was discovered in the application of the galvanic process, by means of which the original plate is multiplied, and the engraver of steel-plates was now obliged to return from his favorite steel-engraving to the treatment of copper which he had almost entirely abandoned.

Soon, the copper obtained by means of the galvanic stream — in spite of its softness — was, on account of its chemical purity, recognised to be more fit even for original engravings, and thus the galvanic apparatus does not only furnish us with the original material for the first figurative representation — that is, for the copper-plate engraving — but, when that is finished, a second, namely a raised plate is executed by means of the galvanic precipitate; this second plate is again placed in the galvanic apparatus, and thereby one obtains a deep plate like the first, fit for printing on the copper-plate press, etc.

Nothing was more natural, therefore, than that, in large editions, the steel-engraving which resisted, was supplanted by copper-plates, which could be multiplied in so simple and cheap a manner — especially in cases when more copies were required than the steel-plate could furnish without being injured.

Steel-engravings copied by means of the galvanic process.

But soon an other means was discovered to assist the steel-plate in shaking off the defeat it had suffered from the galvanic process. A mass of matter, consisting of different elements, — so tender and delicate that not the smallest dot of the picture appears lessened — furnishes us, if laid on in a fluid state, with a correct impression of the finest steel-engraving or copper-plate engraving. If the surface of a plate obtained in this manner is silvered, the conductibility of the galvanic stream is attained, and thus the copying of the plate made possible.

In the same manner as steel offers especial advantages, on account of its hardness, people proceeded still further, and Boettger

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at Francfort and Bromeis at Hanau tried the first to gain a still harder and at the same time purer material for engraving and etching upon, namely glass. By means of two polished equal cylinders, fixed upon each other, with precautious treatment an incredible number of copies may be produced without injuring or breaking the glass-plate, whilst at the same time a peculiarly superior representation may be attained which can only be produced by means of glass. But in order to prevent the possibility of breaking the glass, which might occur if the least neglect took place, or if the cylinders were not quite equal, we attempted to obtain exact copies by means of the galvanic stream, a proceeding that so perfectly succeeded, that even the tint of the surface of the glass is not only imparted to the galvanic plate, but also to the impression on the paper. Hyalography.

That, besides the production of plates for printing, this proceeding which has been improved in the imperial printing-office may become of incalculable importance in the fabrication of glass — instead of polishing it — will soon be proved in a treatise that is to be published separately.

Let us, therefore, select glass in such cases where it appears to be more favorable than any other material. It will permit a pretty extensive application, and will furnish an equally independent representation in its own treatment.

Since the possibility of etching upon it has been discovered, glass, on account of its purity, rivals with all other metals used hitherto for that purpose. Its transparency joins to it other advantages that no metal is able to offer, and therefore glass-etching will — even if it does not supplant everything else as a plate for printing — gain a new field, and that is, the prospect that in future photography on glass will have a chance to become fit for printing. Should our prediction, as we expect it will, be confirmed, then we need no longer use any circuitous road, but we can, after any object has been correctly drawn and etched in a few seconds, by applying the galvanic process and making use of mechanical means

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— namely the copper-plate press — produce any number of copies we choose.

A second department, equally as extensive, is reserved for glass-etching — besides the occupation of the press, — for caustics will at last be applied to all kinds of glass-ware — as well such as is in daily use as such as is but rarely used. The finest drawings, all imaginable figurative representations will in future be able to be applied to windows, glass-doors, glasses of all kinds, etc., which it was impossible to apply hitherto, on account of the expense which the polishing caused; in numerous instances we shall in future be enabled to have etched glass-drawings instead of coloured painted glass.

Production of Guilloches or ornaments.

From the printing on copper, steel, or glass, we proceed to another branch, viz. the art of producing, by means of a pretty simple but ingenious machine, ornaments and pictures in lines which no artist could accomplish even with the finest instrument — neither with regard to their perfection, nor with regard to their beauty. These guilloches can either be applied for design-like ornaments or — as Collas of Paris applies them — for other figurative representations, which can be executed in wood, stone, zinc, copper, steel, and glass — of which impressions of any size may be obtained as well in the common printer's press, as in the copper-plate press and in the lithographic press — as is to be seen from the subjoined plate of type-metal, and from the one of copper which represents the portrait of His imperial majesty the emperor Francis Joseph.

One would think now that there are sufficient modes of proceeding extant for the purpose of figurative representation and multiplication, yet that is not the case, if we search more closely the impenetrable department of the capability of production of the graphical arts.

We now arrive at the boundary line, where the designer makes himself independent of the copper-plate engraver, where he himself — obtaining the original from his mind — creates the picture in

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such a manner, that by a line of his pin, or by a stroke of his brush, the form which is to be used for printing seems already complete.

For original drawings with pen and ink the above named fine mass for copying steel-engravings — consisting of different substances — is especially fit; the mass is covered with dissolved silver, in order that every stroke made by the designer may appear black. After the artist has scratched the picture in the depth — as if he were drawing on paper with pencil — it appears to his eye similar to the black impression, which merely requires a galvanic cover and the deep plate gained from that, to obtain the representation, like the original drawing, out of the artist's hand (without the aid of the copper-plate engraver) from the copper-plate press. Stylography.

A proceeding different from this leads us to almost the same result, if a plate be covered with a ground on which the drawing is executed, and if then the empty spaces are covered with a substance — partly with a roller and partly with a brush — in such a manner, that the spots on which no impression is to be made appear more raised and capable of being printed from the galvanic copy that is obtained. Glyphography. Cirography.

In the same manner of consequences as this proceeding is to off-hand sketches, is likewise an important invention — painting on copper. If a silvered copper-plate is given to the artist, he paints his picture on it with properly prepaired colours, by turns dark and light, until it is finished. After the silver covering has taken place, the galvanic precipitate produces an exact copy of the original painting — the colours that have been laid on stronger with the brush appearing in it deeper and those that have been laid on lighter appearing higher and lighter. Tints may be attained in this way, which the copper-plate engraver, with all his exertion, cannot produce. Galvanography.

All that remains yet for the fancy of the creating human genius to render perceptible to the senses — what, therefore, has not yet been produced in any shape or form to the eye or to the senses

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— the artist can now represent either by means of drawing in a mass, or by means of painting on copper, and that in so perfect a manner that he does not require the aid of a copper-plate engraver or of any one else for producing a plate fit for printing. Thus far the science of technics has paved the way.

No complaint shall be raised in future that in the production of the form for printing a second party had caused faults and imperfections in the drawing, by which the original had been mutilated. Like the musical composer, in listening to the music of the instruments, listens to his original ideas, and is justified to disapprove of any deviation in the execution of the musicians — thus every designing artist will now be placed in the same independent position, able himself to wrap his intellectual creation into technical dress. Besides the bar which is removed in this manner, we gain also the advantage, that the artist is enabled to blend two businesses into one, whereby the cost of production is reduced to one half — this facilitating the publication in a great measure.

Galvanography, though acting as an independent department of art, has, besides, the pliancy of being able to be used as a supplementary means for tints, or rather as the basis of tints, which cannot be attained by means of any other manner of copper-plate engraving. For this latter purpose the copper-plate engraver Schöninger at Munich has availed himself of it, as is to be seen from the last published journal of the society of arts; but in applying galvanography in this manner, so little remained of it, that it should change its name, lest an erroneous notion should be produced with regard to the proceeding. But leaving this circumstance out of the question, the productions of Schöninger have not only met with a ready sale, but have also gained an honorable name, and very justly so!

Why — it may be asked — is Vienna, where similar productions find a ready sale, without native productions of the sort? Why are the walls of our amateurs covered with such foreign products, instead of our applying our capital for that purpose at home?

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Have we, perhaps, no artists!? No, that is not the case, but we have no enterprising persons to risk the capital required — and I cannot abstain from uttering the complaint, that in nearly all trades, societies or associations have formed themselves, but in the noblest of the departments of trade — for the purpose of propagating interest in objects of art — that has not been possible to be done hitherto.

Societies that are established for enterprises have an unfavorable side and a luminous side, according to the tendency that is upheld. They may lead to a monopoly and be prejudicial to the smaller class of tradesmen, but they may also not only avoid doing this, but they can carry out enterprises which it would have been impossible for the smaller class of tradesmen to accomplish. Where larger capital is required and where low prices are intended to be fixed on the article to be sold, the aim can only be achieved by means of united powers. What would else have become of railroads and steam-navigation? Should they have been procured by hackney-coachmen and mariners? The progress of time has continually dictated their establishment.

I am firmly convinced that, owing to the dissipation that reigns among the artistical powers of Austria, nothing is able to remedy this evil, than the establishment of a central institution for the purpose of multiplying objects of art; I am convinced that as soon as a properly managed institution of the kind were established, artists, capital and purchasers would be found in abundance, whereby that dissipated mode of acting would be put an end to at last, whilst genuine artistic activity would attain that point which it has partly reached abroad — that is to say by means of distinguished institutions — in towns that do not number half the inhabitants of our rich and splendid capital!

Galvanoplastic.

We now reach a new era of typography, namely the wonderful application of the galvanic stream to the nature of forms with regard to the press. The purpose that light — or the sun — serves, in conjunction with a *camera obscura*, to drawings,

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that purpose may be attained, with regard to forms for printing, by Jacobi's invention — or rather by his newly discovered practical application — galvanoplastic, which enables us to produce copies without number.

We have, it would almost seem, made pretensions of so extensive a kind on the sphere of action of photography, that scarcely anything has remained to be said respecting the other departments which are of equal importance — for nothing escapes the imitation or multiplication of the former. But we laid stress on the fact, and must mention again, that light does only draw — that it does not paint in colours — that it does not furnish the forms in plastic shape, as can be done by means of casting — by means of cold casting, which requires neither fire nor heated metals, but merely blue vitriol and an original, in order to copy it by letting two different metals act upon each other, for the sulphate fluid of copper sets apart its millions of particles of copper, joins them to the original, and changes them by degrees into a cover of copper.

If we ask respecting the application of this splendid invention, we shall cause some embarrassment as to the reply — namely whether there is anything that it excludes and that is not within reach of it. Every thing that can be seen by the eye, or felt by the senses, is the property of the galvanic stream. Let us take up our position in the department of science, in a cabinet of coins and antiquities, in the Ambraser collection, in the imperial collection of minerals — let us enter the department of industry — for instance an iron-foundery, — what innumerable different elements does that supply the trades and all other human wants with; let us enter the halls of plastic and graphical arts, and we shall wonder how far the galvanic stream has extended its field of activity.

Copper-plate engraving and engraving of steel-plates which obtained a dangerous competitor in lithography — and which, in consequence, were for some time neglected — can only be revived again by the application of galvanoplastic.

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In the same manner as the painter will, at not too distant a period, be unable to do without the photographical apparatus — which draws for him an exact copy of every thing extant — in the same manner the photographical apparatus furnishes the copper-plate engraver with the correct, diminished outlines of any picture that he may intend to copy — or of the same size or larger if he requires it — and by means of the galvanic stream the multiplication of his engraving is effected. Its expensiveness and inability for competition vanished, therefore, at the moment when the copying of engraved plates was made possible; and it only depends now on the designing artists themselves to keep the copper-plate engravers more employed — or, if a want of designers or original pictures should be felt, let the copper-plate engraver make his selection for copying from galleries. The designer may surely ask, „For whom shall I draw? who will remunerate me for my labour?" The copper-plate engraver will make the like remark with regard to his labour. And if I come to the publisher or print-seller, he will remark, „I have as much engraved, as I see people show inclination to buy, and I prefer being satisfied with a small commission on the articles I sell, than running any risk." But this commission-business is the cause of propagating foreign productions in a greater measure, and by it foreign publishers are enabled so much the easier to enter any speculation, because they do not only find a ready market at home, but their productions meet also with willing purchasers all over Austria. What is the reason hereof? Want of equal emulation with the foreign artists. — And why should that be the case? From want of enterprising publishers. — And what is the cause hereof? Want of large capital and of an institution that makes a proper business of it to enter into enterprises of that kind; perchance also want of a sufficient number of subscribers to, or purchasers of, such artistical objects that are published at home.

This ought, according to our opinion, be remedied in all directions in the most efficacious manner. Popular subjects ought

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to be selected for being engraved on copper or steel, these plates ought to be executed to the highest perfection, the price ought to be fixed at such a rate, as to enable the publishers to print a larger number and have a more extensive sale of copies — in short, competition with other countries must be entered into, the object of which is to be to furnish superior productions to theirs at a more moderate rate. There are yet copper-plate engravers at Vienna whose name is favorably known, but we may not fear without reason, that if the present decline of the art last some time longer, these men will grow hoary, without their being any chance of our having to expect an aftergrowth of equal talent. If I consider, what has the intelligent and inexhaustible artist Russ drawn within the space of four years only for the wood-cuts and copper-plates of the imperial printing-office! The copper-plate engravers Axmann, Kotterba, Beyer, Leipold, Schindler, and the hopeful Frommböck, who unfortunately died too early, have executed his drawings with particular zeal.

As the galvanic stream furnishes, at a moderate cost, any required number of copied plates, we can both produce a moderate number of copies, of which the last equal in perfection the first, or we may extend the number of copies, if required, without limit; we have also one more advantage — namely, by being enabled to enlarge or diminish the size of the original plate, we can reduce large plates to the size of a pocketbook, whilst we can enlarge small plates to any required size. Our technical science in that branch leaves, therefore, nothing to be wished for and readily lends its aid for the extention of art!

Whilst this is one of the objects carried out to perfection by galvanoplastic, this department is at the same time an independent one, and from the smallest busts up to the most colossal statues are produced by means of this branch in the highest perfection. We have here before us a small statue of His Imperial Majesty, our beloved monarch — the great hero archiduke Charles — Pilgram, the builder of the steeple of St. Stephens — the geometer

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and architect Hirschvogel, and several smaller statues, and some the size of life.

Which process has supplied us with these productions in such perfection, at so proportionably small a cost and of such small weight, besides their being of precious metal, namely chemical, pure copper! A proof is hereby furnished, that any monument — however small or large it be — can be copied by means of cold casting by the galvanic process. Don't let us think the idea impracticable, that the scattered works of great Italian masters, or of any native or foreign masters, which are now considered as being in the sole possession of the places where they are to be found, will by degrees be multiplied and made accessible to purchasers. Why should not — if the originals remain uninjured — one or more copies be gained for other towns, or even for wealthy private individuals? The original possessor still remains the owner of it, and may, in return for his permission to multiply it, obtain, without any outlay, copies of other treasures of art! Let us abandon the belief, that the value of the original is diminished, if it is admired in more than one place. Will not, on the contrary, both the owner and the object of his possession, gain hereby more extended approbation? Who would at present value the written book less, after it has been printed? and who will diminish his veneration for the works of Rubens, Michael Angelo, or Raphael, because we meet with copies of them here and there? and may not the same example be applied with regard to plastic art?! Let us do away with this trivial vanity and we shall be enabled to see as easily the copies of the subterranean part of the British Museum, or of the collection of the busts at the Louvre, at Vienna, as Englishmen or Frenchmen admire our treasures of the plastic art in their respective metropolis. Not only cities, but whole parts of the world, will then mutually exchange the wonders of art, and where none such are extant, trade will be the mediator and carry the superabundant article of one country to another country that wants it. America, which has attained so high a position in navi-

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gation, requires the other parts of the world, for the purpose of enriching itself with the treasures of art, in return for which — besides other useful articles that we may obtain from it — it will open its gold-mines to us.

Not satisfied that the hand of man has ridded itself from the imitation required hitherto, Nature itself makes her appearance as a moulder, and lends us her aid to a yet simpler mode of representation of every thing extant, and offers at the same time all her treasures — without even retaining one, in order that the galvanic power may reproduce them in numerous copies, and the printing press may publish them in unlimited numbers to men who are desirous of learning.

Natural, self-acting printing-process.

There is no plant, no mineral, no relief, there is nothing that is high, deep or flat, whereof we cannot obtain a wonderfully exact impression in prepared material, which impression is made use of by means of the galvanic process for the production of plates for printing. Thus we see here lace, fossile fish, etched agate, several plants whilst blossoming, several sorts of leaves and mosses — printed by means of a single impression in several colours — represented before our eyes, which we can hardly distinguish from the originals.

We have seen hitherto that the chief problem of the different processes used for printing, was the production of the plate or form used for printing; but that it was always more anxiously aimed at to produce copies like the original, agreeable to nature, without any mediator, and that this was only possible to be achieved by means of the galvanic stream — the casting most in accordance with nature. This cold casting then, in league with the original and the printing-press — without any human mediation — furnishes anything that a thinking being may be desirous of obtaining copies of. From the meteor that drops down from the clouds, down to the mineral that has been hidden thousands of years in the lap of the earth; from the wonderful productions of art to the living objects in the vegetable kingdom;

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from the living animal to the inanimate human skeleton, a cover is produced in a wonderfully short space of time, and, shortly after that, the thick plate fit for printing is produced.

Since the last few weeks the results of this process have extended in a considerable manner. It affords me great pleasure to be able to tell you, that this imitation of the original and the application of the galvanic stream are perhaps the most important inventions that have ever been made, since Gutenberg presented us with his invention of the press and the forms for printing. The field for booty is without limits, the profit that may be gained from this process is incalculable. This mode of proceeding has already met with such sympathy abroad, that very shortly they will there take the lead of us with grand vigor. Don't let us again be made acquainted from thence with the value of our own thoughts and inventions. Patents obtained abroad are not profitable, if the thing be not carried on here, or carried on in a negligent manner. The subject must be laid hold of at home with all possible vigor and energy.

If the original is of so fragile a nature that it would not appear advisable to effect the copying by means of impression, we have discovered the means for copying objects that require the most cautious treatment, by using dissolved gutta percha and the mass above mentioned.

If we wish to diminish an object in any manner, we may surely make use of photography, and can afterwards effect its multiplication by mechanical means; but a still simpler means has been discovered in a substance, the communication of which we owe very lately to His Serene Highness Prince Metternich; by this means we obtain the most wonderful diminutions of any desirable shape, in the smallest details, and thus a form for printing has been discovered as a collateral invention to photography. Diminution.

How manifold are the forms that printing has assumed, if we cast back our looks on the troublesome methods for confiding pictures to the wood-cut that have been in use since the days of

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Gutenberg till the present time, and how singular the tools are that were used for engraving wood-cuts. But what is most remarkable, is that, although so many different methods were invented for apparently the same purpose — all of which fell at variance from jealousy and fear of supplanting one another — each branch has still retained what is peculiarly belonging to it. Only what was heterogeneous to the respective branches separated itself from them by degrees, and emancipated itself from its former state of dependency to an independent department. Thus the wood-cut retains — from the time when Albrecht Dürer used wood of pear-trees and treated it with the knife, up to the time that box-wood is used and treated with the graver — that peculiar power of expression which cannot be attained by any other manner of engraving, besides which there is another advantage, namely that an unlimited number of copies can be printed. Drawings with pen and ink and chalk-drawings on stone show us that incomparable freedom of action; the zinc-plate, easier management and more convenience in storing it away, compared with stone; copper-plate engraving and the engraving of steel-plates, the perfection in the most delicate execution; chemitypy and chalcotypy, a treatment similar to that of copper-plates, together with an incredibly short space of time required for its execution; stylography and galvanography, the dash of the brush or style of the artist; printing on glass, the almost imperceptible wearing off of it and its peculiar fineness and durability; photography, the speed and correctness with which the drawing is performed; galvanoplastic, the exactness with which it resembles the original.

Xylography.

From the youngest daughter of the art of printing — the natural self-acting printing-process — we pass over to the eldest graphical branch — the revered art of wood-engraving. Gutenberg tried to render forms, letters, and figures, by cutting them into wood. We endeavour at the present day, as you will have noticed, to avoid the transportation of objects and to produce from the original another original. I am convinced, Gutenberg does

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not look surly, if he looks down on our productions — I even believe, he would be heartily glad, if he could assist us in improving his invention and profiting from it. It is really too bad, how much his divine purpose has often been debased through the profanation of his gift — the press, to what base representations his types — his small bits of wood — have been abused! What immense advantages could be gained from wood-cuts! Though the wood-cut is, like copper-plate engraving, more suitable to representations the objects of which are not already extant in nature, but which obtain their drapery from the human mind, in order to render them perceptible to the human senses; wherefore the wood-cut will have in future to quit an important field — that of reality — namely of the figurative representations already extant in nature — though it will be used a long time yet for the illustration of such objects and as an ornament for newspapers and books; but the representation agreeable to nature which is effected by means of our galvanic plates, will soon supplant it in cases where the representation of scientific objects, or rather of objects agreeable to nature, is required. Let it be tried at present to found an illustrated newspaper — according to a project nourished by me for years — accompanied by supplements from all departments of nature, from the department of technics, of arts and sciences, executed with the aid of all the above named methods of printing — and it will make way into every house, into every corner where books find access to. The wood-cut is not only to be used for the illustration of witticisms, and thus to fill journals that are not worth spending the time on reading them — the leaves of which are frequently waste-paper the day after publication — it must be applied to nobler purposes. Nothing could be more prejudicial to this splendid gift of figurative representation than modern xylography, which counts some among its disciples, who need only take hold of the graver and cut out the carricature requested of them, without having had an hour's instruction in drawing. This degeneration of wood-engraving was

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the cause why xylography so often vanished from the scene of its activity and only made its appearance again when wortly apostles of Dürer newly interested themselves in its behalf. Look, for instance, on the illustration representing the triumphal procession of the emperor Maximilian etc., and the deepest pity for the useless waste of paper in modern times will be excited in your breast by the sight of it.

How is the beautiful task conceived by typographers that is left to accomplish for wood-engraving? If we view religious representations — are the greater part of them fit to call forth that venerable impression which might be expected from the subject to which they are applied? It is really fortunate that this field has been less frequently made use of than it might be the case, for then it would only be worse, as then the degrading figurative representations would only be still more extensively propagated.

According to my opinion every printing-office, however small, might employ a distinguished wood-engraver, so much do the people long for figurative representations. There is no prayer-book, no almanach, no school-book or popular book, no advertisement that does not need ornaments which would greatly enhance the value of the objects which they illustrate. Let it be tried to-day to found a grand xylographic institution, let us take care to employ it with distinguished productions, let us make hundreds of galvanic casts — but not of such objects as are partly found on sale, but after valuable designs of great renowned artists, — and you may rely on it that it will, like Kretschmar's institution at Leipsic, not only maintain an honorable position, but be a very profitable concern in the bargain. — Nothing is so suitable for xylographic representation as religious tasks, also religious and popular books, by which the mind and the heart are edified. Nothing is so suitable to the printing-machine — respecting large numbers to be produced — as the wood-cut, which, owing to its raised surface, resembles the type, and is accessible, therefore, to

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the millions of inhabitants of our globe, whatever language they may speak. Though the figurative representation in many instances needs no explanation in words and yet does not fail to make an impression on such as can neither read nor write, still we require texts for the explanation of a thousand different objects. In our collection of types you will find every existing nation represented — from the near East to the remotest Indians will find our press in a state to communicate with them in their native language. We can furnish popular books for our home, school-books for our neighbours — if their contents, their artistical adornments correspond — which surpass the productions of other countries; and that we can, or even must, surpass foreigners, is evidently proved by the position we maintained at the London industrial exhibition, where all other countries occupied the background with regard to typography and where no one, besides us, was endowed with the great council-medal!

However small the measure is in which we attained perfection with regard to the printing of distinguished school-books and good popular books — because we neglected to make use of illustrations in most departments where they ought or might have aided — we were urged on in the same degree to overstep the ordinary boundary of letter-press printing, so much so that, whilst with regard to the graphical departments of art before mentioned I complained of want of application, with regard to typography I have to complain of the reverse, namely of superabundance of application. How much is there printed that is not worth the expense of the paper! We will pass over many a thing that is not quite suitable for the present discourse and will commence at once with casting a glance over our own as well as foreign journals. If you look over a dozen of them, you will find that of their contents is printed alike, letter for letter, in all these journals. After the reader has devoted two hours every day to the perusal of the newspapers, after having commenced a hundred sentences, and left off again because he has already read one thing or the other in

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one of the preceding journals — whereby a closely printed sheet becomes reduced to one fourth and the two hours spent unnecessarily might have been reduced to half an hour — he puts the paper away with reluctance, having only gained the uncertainty not to know in which of the newspapers he read the few original sentences that one of them contained. Permit me to view the books that are printed, and if we collect all the publications and examine them, we shall be obliged to pronounce the same judgment, namely that some of it was not worth the expense of the composition, printing, and paper.

Nothing is abused in so high a degree as the time of the reader, paper, and the press. No mechanic or artist shares a like fate, for from every production some kind of material advantage is derived; only the press is employed with so many things that depreciate it and the paper — and still more so the time of the reader, — and there is but that one comfort, that while the reader, be it a child or a man, has wasted his time in this manner, he has, at any rate, done nothing worse. But if we put the contrary question, „What advantage might have been derived by applying those precious hours to the reading of something that is useful?" we cannot help uttering a desire that typography ought to abstain from printing useless things and save the paper and types for better purposes. If any favorable change is to be expected in this direction, the proprietor of a printing establishment must himself be an educated man. He must, like the old master-printers, be a kind of scholar; he must be capable of pronouncing an opinion on the mental production of the author, then he will be a proper publisher. Should be objected hereto, that we raise a publisher to the post of a censor, we have to reply hereto, that only inferior manuscripts would be losers hereby, in having to expect severe criticism, whilst superior manuscripts, in having to expect favorable judgment, would only be gainers. Why do we buy a book with greater confidence in its contents, if it is advertised by one or the other renowned publisher? Because we think the pub-

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lisher capable of giving a sound judgment as to the value of the book! Why does an author rather have his book published at Cotta's than at any other publisher's? Because the former is known to publish only valuable books at his shop, and, for that reason, his publication is sure to meet with a readier sale at Cotta's. In time of yore an established rule was followed, that no printer was considered capable of carrying on his business, if he was not able to print every Greek or Latin classic, of which he must have read himself the proofs, free of errors. Let us compare this with the pretensions of the present day, and we shall — with a few honorable exceptions — find many of our printers who are not able to correct a German book, how much less one in a foreign language; this is the reason of the difference, with regard to correctness, between works printed in England and France and some of our German works.

This induced me to place the character of an apprentice — as far as the young typographers in the imperial printing-office confided to my care are concerned — on a footing different from the one usually granted; that is my motive for having them instructed not only in all the departments of typography, but also in reading and writing, in their native tongue and in foreign languages; I have even lectures held to them on geography and history, in order that the number of well educated typographers may by this means be increased — and I am happy to say that from the course of the first five years I have experienced the most pleasing results.

On treating the section typography, I must not pass by a nuissance without mentioning it, namely that the literary productions of Austrian authors are printed and published abroad. It is from foreign countries that we obtain almost every important literary work. Medical works — the intrinsic worth of which is acknowledged abroad, owing to the high position occupied by the general infirmary of Vienna — mostly form the publications of foreign booksellers and are often published in some of the smaller

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towns of Germany, nay even in the very smallest towns. If there were not so many other objections to this decided wrong, we must object to it from a patriotic and national-economical point of view.

Type-cutting, type-founding. Typography.

We have now arrived at the close of our treatise, at the proper nucleus, the soul of the printing business. — The sublime invention of Gutenberg which with unexampled rapidity was propagated all over the world, has found a proper representative in Meyer's Album of the year 1840, into which the greatest scholars and the most celebrated poets laid down their homage, and every one that applies himself to the art of printing must be urged on so much the more to contribute to its glorification. The government institution confided to my care has chosen for the sole object of its existence the desire to contribute its mite to the nurture of the graphical arts, and has endeavoured, above all, most energetically to pursue the department of type-cutting in steel-punches. After a collection of types of all the nations of the globe, previously founded by me, all the known alphabets — which are specially named above — were executed there. In the same manner as we perceive here a type for the blind as well as for those who see, accompanied by the mattrise and the lump of lead belonging to it, in the same manner has been subjoined, for the sake of greater explicitness, a line of every sort of the following objects — collected in a quarto stereotype-plate, namely — types for the blind and scrypt-types, music for the blind and for those that see, and all foreign original alphabets, with variations of them extending to past centuries. All the types extant in the imperial government printing-office at Vienna are cast according to the typometrical system carried out by me, and the proportions of the space of every letter as well as of the so called figures for filling up the empty space (quadrats) are represented in the quarto stereotype-plate opposite.

Stereotyping.

Typometrical system.

A thought which has been for the last twenty years untiredly pursued by me, is the establishment of uniformity in the body of

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the letters of all the printing-offices in Austria, in order that, if the space that a work is to occupy has been once calculated, the same might be printed in any typographical establishment of the empire — whilst, on the other hand, the printer might, if his letters are worn off, or if he accidentally and very promptly required any, be able to buy them of the letter-founder, who always keeps any quantity on stock that might be desired — cast on a uniform body — instead of having expressly to order them as was the case formerly. In the imperial government printing-office at Vienna all the letters are cast according to my typometrical system, a subject a complete treatise of which is printed in the first volume of the memorials of the imperial academy of sciences. How important this subject is, may be concluded from the circumstance, that in France — when Didot and Fournier proposed a similar improvement in the organisation of letter-founding to the emperor Napoleon I. — he issued a decree to all the printers of France that they had, under pain of losing their business, to participate in this judicious enterprise by changing by degrees the irregular state of their types into a uniform one.

In Austria also a similar proposal was already made in the year 1847 by Baron von Kübeck — the present president of the council of the empire, then president of the imperial cabinet — and his majesty the emperor granted the most powerful support to the promotion of this useful improvement, but, on account of the interruption that took place in consequence of the events of the time, the execution of such a wish was naturally be obliged to be delayed.

Though our efforts are sufficiently remunerated by the consciousness of the results we attained and by the attentions we experienced, yet it will not appear superfluous to render conspicuous the prizes that were awarded to us by the London jury at the exhibition of 1851:

1 council-medal, for the joint graphical productions; **2 prize-medals**, for photography and colour-printing; **1 prize-judge medal**; **1 medal for services**, and **1 remembrance-medal** —

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if we had no other motive for so doing, but because there was no other exhibitor besides us to whom the council-medal for the XVII. class has been awarded, and on the other hand, because there is no other private or government institution extant to which all the medals have been awarded. The imperial government institution of Vienna has, from the circumstance of being in possession of all the prizes awarded to it at the London exhibition, been raised to the term „unicum."

We gratefully made use of this rare occurrence for the purpose of glorifying the newly invented art of galvanoplastic, of which all the graphical departments of art of modern times are dependent — or rather, to which it readily offers its services — in order that art and science may become the joint property of all.

There is nothing under the sun now that is not accessible to multiplication. Everything that is extant in nature, art, and science is now the property of the press thus ennobled. The press has now the dominion over all the provinces where the human mind reigns!

Besides the circumstance that none of these departments is superfluous, but that each of them has its own share secured for itself, there is another advantage accompanying most of these graphical departments of art, viz. removing their being imitated through men who only individually see and feel. The artist changes the scientific object into an image of his fancy and creates, after his hand and eye have grown tired, the phantom of his perception. In the same manner as the painted portrait of a man contains a mixture of truths and untruths, in like manner every imitation, if carried out in the manner hitherto applied, represents the ungenuine parts that are mixed up with it.

It is only the original itself that can furnish a copy, either by means of photography or by means of stamping and the galvanic stream.

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Decisions of the Jury at the great London Ind. Exhibition 1851.

In the *„Reports by the Juries on the Subjects in the Thirty Classes into which the Exhibition was divided,"* which appeared in London in 1852, we find under class XVII, page 396, „It will be observed that the Jury, in strict conformity with the principles laid down by the Royal Commission, have only recommended **one Council Medal, and that for typography**; not that they did not recognize the excellence and beauty of many of the specimens exhibited, and the skill and perfection which, in many points, the art of printing displayed, but because there did not appear to be any production so clearly bearing the character of *novelty of invention or new application of a known principle* as to justify such a recommendation, **with the exception of the products of the Imperial Court and Government Printing-office of Vienna**, which presented both novelty of invention and a number of new combinations in the art of typography."

Then under the same class, page 399, „Printing, invented at Strasburg and at Mayence, and patronized by the Emperor Maximilian, who obtained masterpieces from it at its very commencement, appears in this Exhibition with a degree of splendour which has caused general surprise. No less encouraged in our day by its present sovereign, the Imperial Printing-office of Austria has proved itself equal to its duties, and has accelerated the progress of the art by numerous experiments of all kinds. Xylography, engraving, type-founding, stereotyping whether by plaster moulds or by means of gutta percha and the galvanoplastic process, electro-metallurgy, by which fossil fishes and animals buried in the antediluvian era are reproduced upon paper; galvanography, galvanotype, chemitype, all those new applications of art and science which dimly foreshadow an unknown future, are represented here; and lithography, that new sister of typography, also appears, with the new adjuncts of chromo-typy and chromo-lithography.

The beautiful and rich collection of Oriental types, of which we have counted more than a hundred different sorts, as well engraved as they are well cast, proves that in Austria learning is not less encouraged than the arts.

By the side of so many objects relating to typography, we must admire the typographic plates, each measuring 540 square inches, formed by the galvanic process, and producing, in copper, letters of all languages, from which many millions of copies may be printed without any appearance of wear and tear."

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Page 405, — — — „The 150 foreign founts in the specimenbook of the National Printing-office of France offer an interesting subject of comparison with the rich collection of the Imperial Printing-office of Austria."

— — — „It is to be desired that the National Printing-office of France, following the example of the Imperial Printing-office of Austria etc."

Page 407, „The Imperial Printing-office of Austria has exhibited the whole collection of the new applications of the typographical art, such as the galvanoplastic process, galvanography, galvanoglyphy, and chemitypy, which, bringing their co-operation to the aid of typography, enable it to reproduce, in some degree, nature itself. It may therefore be said that these new branches are to typography what photography is to the art of drawing."

The Galvanoplastic Process. — „We have, for instance, seen antediluvian fishes reproduced upon paper, at this Exhibition, with the exactness of nature itself. By means of successive layers of gutta percha applied to the stone inclosing the petrified fish, a mould is obtained, which being afterwards submitted to the action of a galvanic battery, is quickly covered with coatings of copper, forming a plate upon which all the marks of the fish are reproduced in relief, and which, when printed at the typographic (?) press, gives a result upon the paper identical with the object itself."

Galvanography. — „The Austrian Printing-office has shown us some remarkable results of this process. An artist covers a plate of silvered copper with different coats of a paint composed of any oxide, such as that of iron, burnt terra sienna, or black lead, ground with linseed oil. The substance of these coats is of necessity thick or thin, according to the intensity given to the lights and shades. The plate is then submitted to the action of the galvanic battery, from which another plate is obtained, reproducing an intaglio copy with all the unevenness of the original painting. This is an actual copper-plate, resembling an aquatint, and obtained without the assistance of the engraver."

Chemitypy. — „For the purpose of obtaining casts in relief from an engraving, the process of chemitypy is equally ingenious. A polished zinc plate is covered with an etching ground; the design is etched with a point and bitten in with diluted aquafortis; the etching ground is then removed, and every particle of the acid well cleaned off. For this purpose the hollows of the engraving are first washed with olive oil, then with water, and afterwards wiped, so that there may not remain the least trace of the acid. The plate, on which must be placed filings of fusible metal, is then heated by means of a spirit-lamp, or any convenient means,

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until the fusible metal has filled up all the engraving; and when cold it is scraped down to the level of the zinc plate, in such a manner that none of it remains except that which has entered into the hollow parts of the engraving. The plate of zinc, to which the fusible metal has become united, is then submitted to the action of a weak solution of muriatic acid, and as of these two metals the one is negative, and the other positive, the zinc alone is eaten away by the acid, and the fusible metal which had entered into the hollows of the engraving, is left in relief, and may then be printed from by means of the typographic press."

Page 410, „The Imperial Printing-office of Austria, decomposing each part of a Chinese word into as many pieces as it contains strokes of the pen, reconstructs the words by means of these little pieces, which the compositor groups together so as to construct any Chinese word. The number of *points* and *strokes* is about 400, and they appear to be a most complete system of Chinese typography."

Page 451, „The Jury have awarded **a Council Medal** to the **Imperial Court and Government Printing-office of Vienna** for their new processes in typography, galvanoplastic, and chemitypic printing: for the variety of their Oriental types, and perfect execution of the punches, as well as for the general excellence of the numerous specimens exhibited in stereotyping, electrotyping, printing, and bookbinding."

Finally, under class XXX, page 703, „*Lithochromy*. — The Imperial Printing-office of Vienna. The work, „Paradisus Vindobonensis," exhibited by this establishment, contains a great number of lithographs of flowers and plants, which are represented in form, colour, and every other respect, with remarkable truth to nature. **Prize Medal.**"

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Survey of the Technical Procedure and t

in the Imperial Court and Governm

If we look at a printed figure or book, the question naturally arises: in what manner has it „raised printing“ or „concave printing,“ that is to say, the figure or the letter may either be scratch eye like a wood-cut with an even surface, in which al

Raised Printing.

The following departments belong to „raised printing,“ or printing with letters, —

1. **Punch-cutting**, by which we endeavour to obtain a raised representation in steel of any letter or ornament previously drawn, which, after having been hardened, is struck into copper, and from which moulds or mattrises are gained; in which

2. the **Letter-founders** cast many millions of letters, by hand, by means of so called instruments, or also by means of the letter casting-machine invented not long since. — These cast letters form the chief constituent parts of

Typography, which is divided into the two occupations of composing and printing, as well for those that see, as for the blind. Already before printing with moveable types was invented, flat pieces of wood were used, in which raised figures or letters were cut out; similar to this old procedure is the modern

Stereotyping. Stereotype-plates are likewise firm plates with raised figures, with that difference only, that the letters in these plates are moulded or cast from a form composed with moveable types. Such plates are produced by means of plaster of Paris or paper moulds into which type-metal is cast, or also by means of gutta percha moulds into which copper is cast in a cold state — galvanoplastic. — All the named departments are connected with

Typometry and the

Knowledge of types and languages. The former has the care of exactly measuring and executing all those bodies, metal rules, quadrats etc., that are required for typographical purposes, and that according to a certain proportion of the different bodies to one another, which is calculated with mathematical exactness; — the latter provides all the intellectual perception that a typographer requires with regard to the knowledge of types and languages.

Departments useful for illustration, —

1. **Of engraving of wood-cuts** or xylography there are many methods, a part of which approaches more the imitation of copper-plate engraving, whilst the other part is fit for exactly copying a sketch drawn by hand.

2. **Chemityping** is especially fit for plans, maps, guilloches and imitations of etchings — in all these cases it represents the wood-cut. The required drawing is etched in the usual manner into a zinc-plate, the plate is then cleaned and the strokes that appear deeper in the drawing are dissolved by means of an easily fusible metal in such a manner, that the whole plate is covered with this metal. The superfluous part of it is removed by means of scraping, until the zinc appears even again and only the deeper strokes of the drawing remain filled with the before named metal. Repeated etching now removes the still remaining superfluous zinc, and raises the strokes that appeared deeper before and are now filled with the easily fusible metal, the acid having no influence on them because the easily fusible metal stands in the same proportion to the zinc in which positive electricity is to negative electricity. But the large empty spaces are removed by mechanical means.

3. **Glyphography** pursues similar purposes, but by a different method; this art also endeavours to appropriate to itself a part of the task which, strictly speaking, belongs to wood-cut engraving. After the design of the writing or drawing has been sketched in a proper position, it is etched in the usual manner; the ground, or all the spaces that are afterwards to appear white and empty, are by degrees raised by means of quickly drying colour, until the strokes of the drawing or writing appear to be sufficiently deep to permit of the moulding of the whole plate — as if it were a mattris — by the means applied by galvanoplastic, the result of which forms a production for „raised printing.“

Concave Printing.

Chalcography and **siderograph** a contrast to printing from r surfaces, appears copper-p printing, or the impressio writing or drawing that is engr into any depth. These may be e executed in steel or copper.

Galvanography; drawings on z with certain substantial water-col and copied by means of galvano stic; the first drawing furnishing it were, a raised plate, the galv production is an concave plate the use of the copper-plate pres

Stylography; etchings with a on a certain mass, by which bounds are set to the hand of performing artist, whilst his eye covers sufficient marks by whic can calculate the effect of his w owing to the contrast between black ink and its white cover The galvanoplastic copies he furnish plates fit for being pri from.

Hyalography or the **art of etch** on glass differs with regard to material, but not with regard to method applied in printing, from preceding departments. The ma rial on which the work is execu namely the glass, permits the p forming artist to produce cer tints in his drawing which could be attained on any other mater Even the difficulty of printing is tirely done away with through galvanic copy.

Engraving, guilloche making, the **numismatical machine** also oper as well for the application of copper-plate press as for that typography and lithography.

The **diminution** of engraved graved plates. The copies obtai of such plates by means of gelu are treated in such a manner by application of astringent chemi means, that the result produced c sists in the required diminution; extent of twelve square inches, instance, may be reduced with perf exactness to four square inch without injuring in the least the u lity expected from it. The rais plates obtained in this manner multiplied by means of galvanopla to be fit for printing from.

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plication of the Graphical Branches of Art

ting-office at Vienna. 1853.

ed. One or several of the next following branches of art may have been applied; it may either be into a metal, or it may be cast in a mould or mattris, in which latter case it represents itself to the spaces that do not belong to the drawing are cut out.

Chemical Printing.

e third group of the graphical ts of art consists in che- printing, that is to say where to be printed from is neither by high nor deep, but the of any given drawing or writing ained by making only those of the surface which contain rawing, suck up the ink, whilst ner places, by means of pre- preparation, are made to e ink. These are, —

Printing from stone or litho-

Chemigraphy or chemical print- a metal, especially on zinc;

Anastatic or renovation, and s means making fit for printing, ood-cuts and other printed ob-

The methods applied in the exe- n of the drawing or writing that ployed for chemical printing are ained; they may be executed by s of chalk or by means of ink, by means of the pen, paint- sh or by means of the pin etc.; method of graving mostly re- bles copper-plate engravings, but nting as well of this as of ny other method applied is exe- d in the chemical way.

Chromolithography or colour- ing from drawings on stone does only furnish coloured drawings, we are also able to produce by ns of it perfectly satisfactory ations of paintings in water- urs or oil-colours, as may be wn by the specimens lying here ore you. Its field for activity is ost unlimited, as it comprises and science, the past and the sent.

But colour-printing, merely as ch, can also be attained by ap- ying the first two methods of print- g or by combining these two me- ods, or by combining them with a third method. But in all these ethods it is indispensable for the erforming artist to have practically ained not only the exactness and rfectness of the drawing but also e proper composition and arran- ement of the colours, else he will ver attain the aim he has in ew.

Natural Self-acting Printing Process.

We now come to the fourth group of the graphical departments of art, in which either the primitive powers of nature are themselves made use of for the production of such objects, or the actual objects are made subject to multiplication, by means of technical expedients. These are, —

1. Galvanoplastic: the application of the hydro-electric stream, in order to form precipitates from the solutions of metals, is here carried on in the most extensive manner and with the greatest success, in almost all the graphical departments. It supplies the letter-foundries with copper concave moulds from graved objects made of materials, from which hitherto it has been impossible to gain such moulds; it offers to the letter-press the most durable stereotypes and multiplications of figurative representation and writing in the raised manner of unlimited number; the latter is also the case with regard to the copper-plate press, in all the methods that can be applied to it. Besides, its very name indicates that this art is elected to copy both ancient and modern works of art in a worthy manner, both with regard to shape and material.

2. The natural self-acting printing process includes several methods by which the objects required can be represented with great exactness and to the most minute and most delicate details. Leaves, herbs, plants etc. are impressed on soft metal, then copied by means of galvanoplastic, in order to be multiplied by means of the copper-plate press in the proper colours and in any number that may be required.

The same is the case with fossile fishes, leaves, and other petrifications, with that difference only, that gutta percha is used in obtaining the first mould.

Lace, ladies' crotchet-work etc. are also treated in the same manner as leaves and plants, with that difference only, that the plates gained from them are especially fit for the letter-press. — But meteorolites and etched quartzes are by a similar method changed as it were into plates fit for raised or concave printing.

Like in galvanoplastic electricity — the primitive power of the world which streams through every thing — is made subservient to technics, so in

Photography the primitive power of light, which animates every thing, is forced to furnish copies of objects that extend over almost all the departments of human knowledge. Exactness in the drawing, in the arrangement of light and perspective are the characteristics of superior productions of photography, which, even to the creative artist, may serve as objects for study. In copying works of sculpture, photography is not to be surpassed, nor in surveying views. Even valuable paintings of renowned artists are first copied by means of photography, of any size that may be required, in order to be afterwards multiplied by means of colour-printing. Diminishing and enlarging forms also part of its vocations; but the latter is separately performed by means of

Microtypy, which places the marvellous objects seen through the microscope on the paper, by the means applied in photography; they then almost resemble drawn pictures, but they are executed in such a manner, that such a representation is fit for banishing every doubt with regard to the objects we have seen.

Although these kind of pictures may be multiplied by the method applied in photography, still, owing to the copies obtained of photographs by means of the galvanic process being capable of being etched, even the mechanical press may be used for the production of objects of which larger numbers are required.

In order to form a correct idea of the technical manipulation of all these departments of art, the reader cannot do better than view an institution in which even all these graphical auxiliary departments are carried on; for the limited space of this pamphlet does not permit us to give a more detailed description of them, to much the less so, as the rapid progress that is made in some modes of procedure sometimes outflanks already in the next hour the present point of view and ranges it to the past.

L. Auer.

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— — Typenschau des gesammten Erdkreises, angefertigt in der k. k. Hof- und Staatsdruckerei. 1847. gr. Placat in 10 Tafeln.

Hierzu ein Stammbaum aller Alphabete des Erdkreises 1848. gr. Placat. (Hof- u. St.-Dr.)

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— — Epistulae novi testamenti coptice. 1852. gr. 8. (Ebendaselbst.)

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— — Der Frühlingsgarten von Mewlana Abdurrahman Dschami. Persisch und deutsch. In orientalischer Ausstattung. 1846. gr. 8. 3 fl. (Hof- u. St.-Dr.)

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— — Die fossilen Mollusken des Tertiärbeckens von Wien. Von Dr. M. Hörnes. 1851 u. 1852. 1.—4. Heft 4. (Sämmtliche Werke der geolog. Reichsanstalt bei W. Braumüller in Wien.)

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Jellačić, Jos. Frhr. v., Gedichte. Der Ertrag ist für den Jellačić-Invalidenfond bestimmt. 1851. gr. 8. (Bei W. Braumüller in Wien.)

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